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monitoring/  
evaluation program

# Interagency ROCKY MOUNTAIN FRONT

Wildlife Monitoring/Evaluation Program



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Management Guidelines for Selected Species,  
Rocky Mountain Front Studies

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Interagency Rocky Mountain Front  
Wildlife Monitoring/Evaluation Program

## Management Guidelines

Grizzly Bear	Elk
Mountain Goat	Mule Deer
Bighorn Sheep	Raptors

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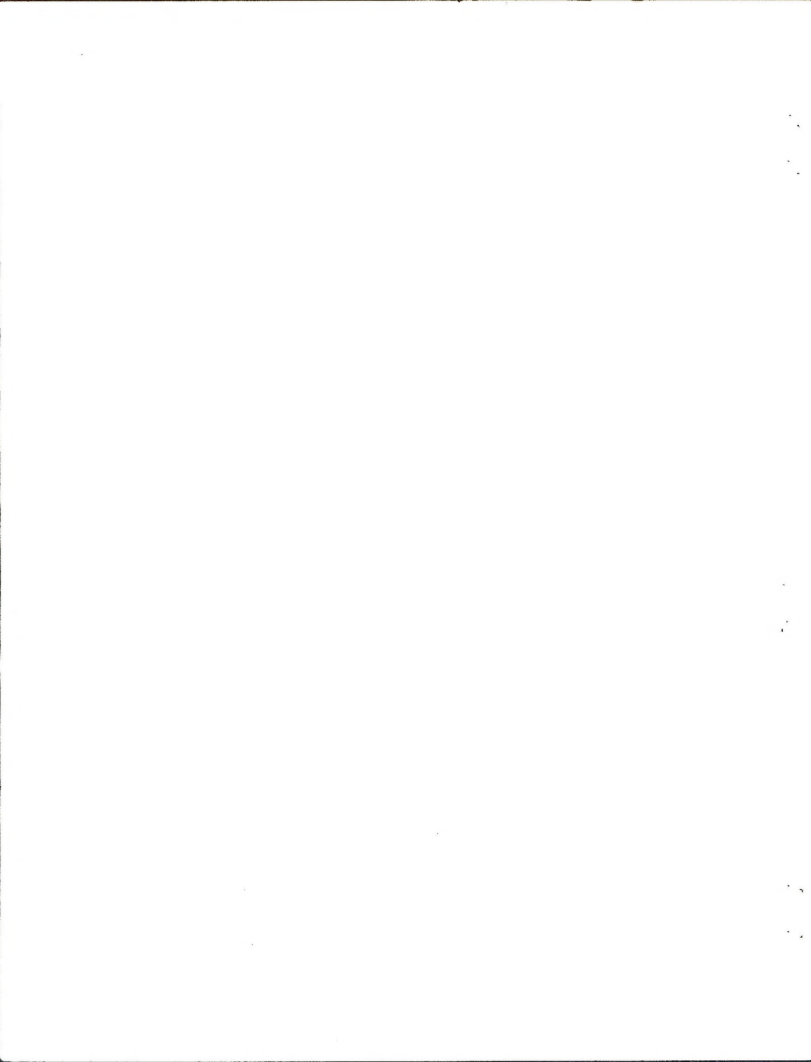
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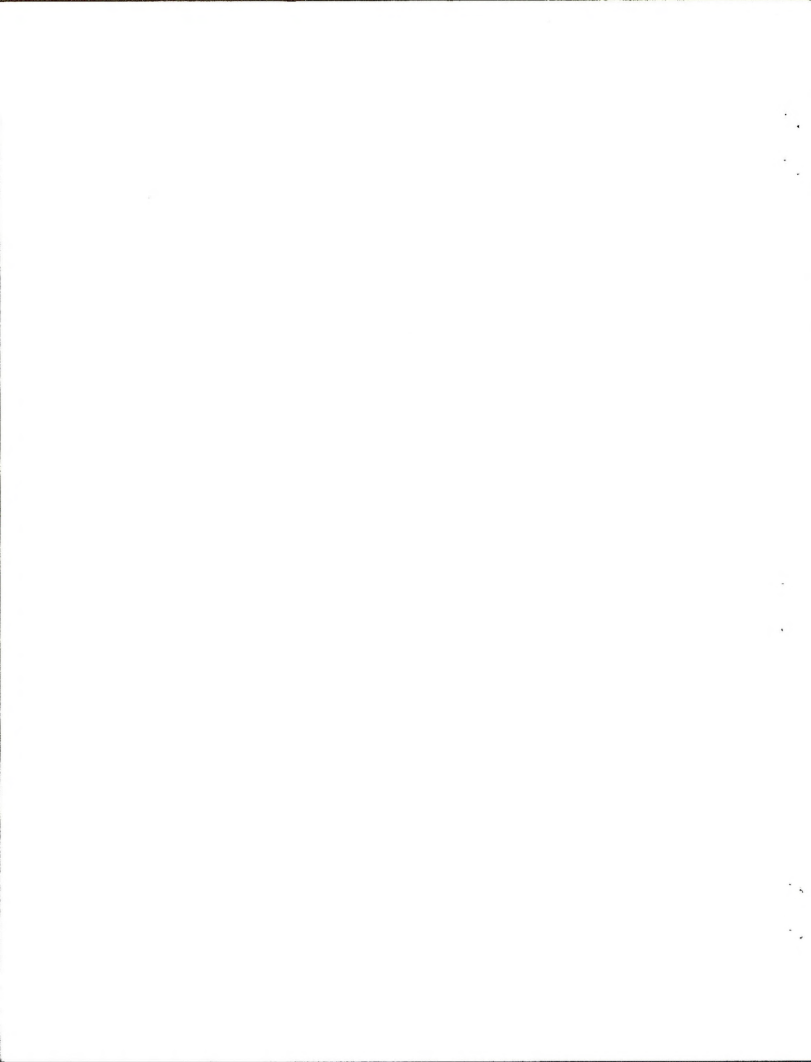
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## ACKNOWLEDGMENTS

The contents of this document have been developed over the past several years (1980-84) during which time some individuals have been involved continuously and others for shorter periods due to study completion, changes in job assignments or transfers within their agencies. The following list includes all of the people who have participated on the Technical Committee and/or been directly involved in monitoring studies on the species indicated since the Rocky Mountain Front Monitoring Program was initiated.

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Special appreciation is extended to Ann Bishop, BLM, Lewistown, for the cover and all illustrations within this document.

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NOTE: Monitoring study personnel participate on the technical committee for their species.



## Introduction

The Interagency Rocky Mountain Front Wildlife Monitoring/Evaluation Program was initiated in 1980. A principal goal of this program was to sponsor study efforts; whereby wildlife management guidelines, based on sound scientific findings, could be developed to aid land managers in their planning of human activities along the Rocky Mountain Front.

The original charter for this program specified that management guidelines were to be considered "interim" until five years of study had been incorporated into them. However, the guidelines developed thus far are currently being used as firm guidance by the involved agencies. Further, at the end of this five year period these guidelines should not be locked in concrete by the term "final". It is highly likely that studies will continue and additional findings will dictate new or revised guidelines. Therefore, these two terms will not be used and the management guideline development process and associated document are to be considered part of a dynamic planning process subject to periodic review and modification as additional study findings become available and as long as the need for them is present.

In the event that on-going monitoring results in the need for a new guideline or the modification of an existing guideline, it can be submitted at anytime by the procedures described and on the form given on the last two pages of this document.

The following management guidelines are based on the best information currently available. They are a result of current or recently completed studies on selected wildlife species. Field investigators conducting the studies have completed extensive literature reviews on the various species considered. The guidelines which have been formulated and presented in this document are not only the result of study findings and literature review, but incorporate the professional judgement of the technical personnel involved.

## Objective

The need for management guidelines is predicated on management concerns involving the effects of existing and proposed land uses and human activities upon various wildlife species and their habitat. The objective of the development and application of management guidelines is to avoid or minimize the following effects of human related activities which may adversely impact some or all of the selected wildlife species being considered:

- A. Physical destruction of important wildlife habitat components.
- B. Human disturbance that would displace various wildlife species from important seasonal use areas.
- C. Increased direct human caused mortality.
- D. Increased stress due to higher human activity levels.
- E. Direct mortality or physical impairment resulting from environmental (chemical) contaminants.
- F. Increased wildlife/human interaction resulting from habitat intrusion or displacement.

### Management Guidelines

Management guidelines provide coordination measures designed to avoid or minimize the potential conflicts previously identified between human related activities and wildlife. Although many of the guidelines are applicable to a variety of human activities, some of them are specific to a single activity. Oil and gas exploration and development has received special emphasis due to the relatively high level of activity in recent years. As a result, some of the guidelines apply specifically to that activity.

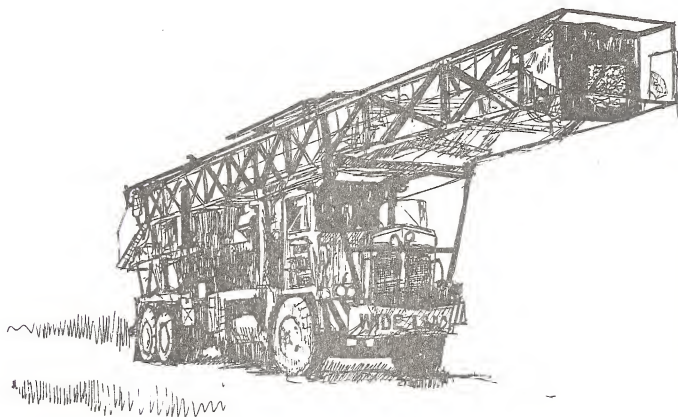
Approved management guidelines will be included in permits, contracts or other formal authorizations for human activities as applicable. Omissions or modifications of applicable guidelines in such authorizations will be documented in an EA report or other appropriate document concerning the activity involved.

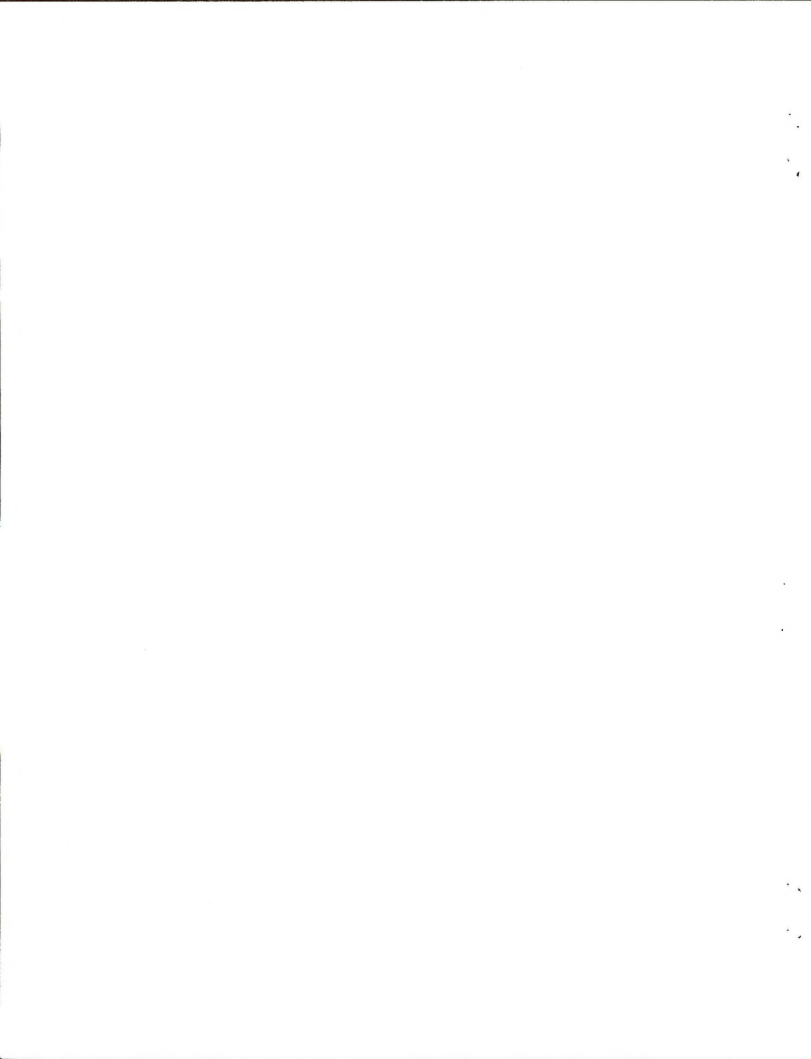
### Monitoring

A majority of the radio tracking and habitat survey data collected to date has been baseline information including the identification of seasonal ranges, reproduction areas, breeding areas and migration corridors. Future studies will place increasing emphasis on the monitoring of effects of increased human activity levels, particularly those associated with oil and gas exploration, on the wildlife species being studied. The management guidelines presented in this document are only partially based on monitoring information collected during the current studies on the Rocky Mountain Front. An important consideration in further monitoring efforts will be to test and validate the guidelines as to their effectiveness and applicability.

# MANAGEMENT GUIDELINES

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## PART A. General Management Guidelines

The following general management guidelines are applicable coordination measures that will be considered when evaluating the effects of existing and proposed human activities in identified seasonally important habitats for a variety of wildlife species.

1. Identify and evaluate for each project proposal the cumulative effects of all activities, both existing uses and other planned projects. Potential site specific effects of the project being analyzed are a part of the cumulative effects evaluation which will apply to all lands within a designated biological unit. A biological unit is an area of land which is ecologically similar and includes all of the yearlong habitat requirements for a sub-population of one or more selected wildlife species.
2. Avoid human activities or combinations of activities on seasonally important wildlife habitats which may adversely impact the species or reduce the habitat effectiveness.
3. Space concurrently active seismographic lines at least nine (9) air miles apart to allow an undisturbed corridor into which wildlife can move when displaced (Olson, G., 1981). One line survey crew may be allowed to work between active lines in order to reduce the total time of activity in any one area.
4. Establish helicopter flight patterns of not more than one-half (1/2) mile in width along all seismographic lines, between landing zones and the lines, and between landing zones and other operations, unless flying conditions dictate deviations due to safety factors.
5. Because helicopters produce a more pronounced behavioral reaction by big game and raptors than do fixed-wing aircraft, helicopters will maintain a minimum altitude of 600 feet (183 meters) above ground level when flying between landing zones and work areas where landing zones are not located on seismic lines, unless species specific guidelines recommend otherwise (Hinman, H., 1974; McCourt, K.H., et al 1974; Klein, D.R., 1973; Miller, F.L. and A. Gunn, 1979).
6. Designate landing zones for helicopters in areas where helicopter traffic and associated human disturbances will have the minimum impact on wildlife populations. Adequate visual and/or topographic barriers should be located between landing zones and occupied seasonal use areas.
7. The use of helicopters instead of new road construction to accomplish energy exploration and development is encouraged.
8. Base road construction proposals on a completed transportation plan which considers important wildlife habitat components and seasonal use areas in relation to road location, construction period, road standards, seasons of heavy vehicle use, road management requirements, etc.
9. Use minimum road and site construction specifications based on projected transportation needs. Schedule construction times to avoid seasonal use periods for wildlife as designated in the species specific guidelines.

10. Locate roads, drill sites, landing zones, etc. to avoid important wildlife habitat components based on a site specific evaluation.
11. Insert "dog-legs" or visual barriers on pipelines and roads built through dense vegetative cover areas to prevent straight corridors exceeding one-fourth ( $\frac{1}{4}$ ) mile where vegetation has been removed (Stubbs, C.W. and B.J. Markham, 1979).
12. Roads which are not compatible with area management objectives and are no longer needed for the purpose for which they were built will be closed and reclaimed. Native plant species will be used whenever possible to provide proper watershed protection on disturbed areas. Wildlife forage and/or cover species will be utilized in rehabilitation projects where deemed appropriate.
13. Keep roads which are in use during oil and gas exploration and development activity closed to unauthorized use. Place locked gates and/or road guards at strategic locations to deter unauthorized use when activities are occurring on key seasonal ranges.
14. Impose seasonal closures and/or vehicle restrictions based on wildlife or other resource needs on roads which remain open.
15. Bus crews to and from drill sites to reduce activity levels on roads. Shift changes should be scheduled to avoid morning and evening wildlife feeding periods.
16. Keep noise levels at a minimum by muffling such things as engines, generators and energy production facilities.
17. Prohibit dogs during work periods.
18. Prohibit firearms during work periods or in vehicles traveling to and from work locations.
19. Seismographic and exploration companies should keep a daily log of activities. Items such as shift changes, shut down/start up times, major changes in noises or activity levels, and the location on the line where seismic crews are working should be recorded.

#### LITERATURE CITED

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- Stubbs, C. W. and B. J. Markham. 1979. Wildlife mitigative measures for oil and gas activity in Alberta. In, Mitigation Symposium, Rocky Mountain Front and Range Experiment Station, Fort Collins, Colorado. Gen. Tech. Report RM-65. 684 pp.

## PART B: Species Specific Management Guidelines

The species specific management guidelines which follow provide coordination measures necessary to protect important habitats or seasonal use areas for several wildlife species which were selected for intensive baseline surveys on the Rocky Mountain Front Study Area. Monitoring of the effects of human activities on these species and their habitats will continue to receive special study emphasis.

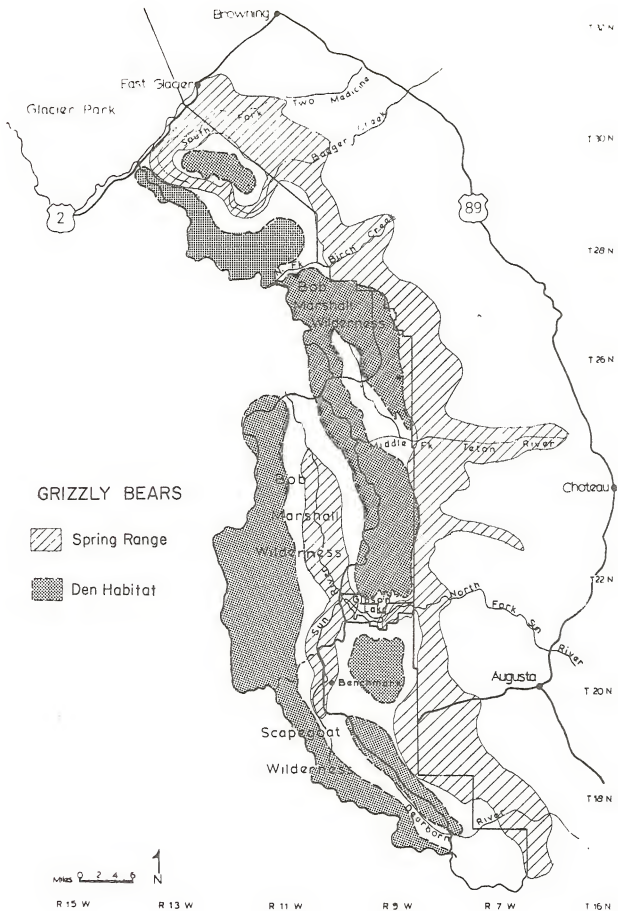
Maps which delineate the seasonally important habitats for which timing restrictions are specified have not been included in the management guideline document and are not available for general distribution. Copies of these maps are available for inspection at the offices of the four Agencies involved in the Rocky Mountain Front Wildlife Monitoring Program.

These guidelines together with the "general management guidelines" will minimize, but not eliminate, the impacts of disturbances caused by human activities on these species. Species specific guidelines are currently available for grizzly bear, mountain goat, bighorn sheep, elk, mule deer and raptors.



# Grizzly Bear





## Grizzly Bear

Study results documented to date along the east Rocky Mountain Front are the basis for the development of management guidelines for grizzly bear and their habitat. During the period from 1977-1979, research was carried out by the Border Grizzly Project under a contract with the Bureau of Land Management.

Since 1980 the Montana Department of Fish, Wildlife and Parks has assumed the intensive grizzly bear monitoring work with funding continuing from the Interagency Monitoring Group, private industry (American Petrofina, Williams Exploration, Sun Exploration) and the Nature Conservancy.

These guidelines are based on the intensive grizzly bear monitoring information collected in recent years on the Rocky Mountain Front Study Area. They will be considered tentative and subject to revision as long as radio monitoring studies and associated habitat surveys are continued on grizzly bear in the area. Much of the information collected to date is concentrated in the area between the Teton River and the North Fork Dupuyer Creek. Intensive monitoring work will be expanded to other areas as funding becomes available. These guidelines were developed as a direct result of grizzly bear monitoring conducted on the east front. They represent guidelines that, when followed, will mitigate but not eliminate influences of human activities on grizzly bears and grizzly bear habitat. Human activities within grizzly bear range will have effects, however subtle, on grizzly bears.

All previously mentioned "general management guidelines" are applicable coordination measures that should be considered when evaluating human activities in grizzly bear habitat. The following are additional species specific guidelines.

1. Avoid human activities in identified grizzly bear habitat constituent elements or portions of constituent elements containing specific habitat values during the following seasonal use periods (see data summarization):
  - A. Spring habitat (concentrated use areas) ----- April 1 - June 30
  - B. Breeding areas ----- May 1 - July 15  
(Currently identified breeding areas include upper Muddy Creek, the head of Rinkers Creek, the Ear Mountain area, and the head of the North Fork Dupuyer Creek)
  - C. Alpine feeding sites ----- July 1 - September 15
  - D. Subalpine fir/whitebark pine habitat types -- August 1 - November 30
  - E. Denning habitat ----- October 15 - April 15.
2. Avoid human activities in grizzly bear habitat components which provide important food sources during spring and early summer, April 1 - July 15. These habitat components include riparian shrub types, Populus stands, wet meadows, sidehill parks, and avalanche chutes. Maintain an undisturbed zone of at least 1/2 mile between activities and the edge of these habitat components where many important bear foods occur.
3. Establish flight patterns in advance when activities require the use of helicopters. Flight patterns should be located to avoid seasonally important grizzly bear habitat constituent elements and habitat components during the designated seasonal use periods.

4. No seismic or exploratory drilling activities should be conducted within a minimum of one mile of den sites during the October 15 - April 15 period (Reynolds, P.E., et al, 1983).
5. Seismic permits should include a clause providing for cancellation or temporary cessation of activities, if necessary, to prevent grizzly/human conflicts.
6. Scheduling of well drilling on adjacent sites, within important grizzly bear use areas, should be staggered to provide a disturbance free area for displaced bears.
7. Pipeline construction required for the development of a gas or oil field should be condensed into the shortest time frame possible and subject to seasonal restrictions when conducted in important grizzly bear habitat.
8. Field operation centers associated with seismic or oil/gas exploration activities should be placed carefully to avoid seasonally important habitat components or constituent elements. Such placement of sites is necessary in order to avoid direct or potential conflicts between man and grizzly bear.
9. Retain frequent dense cover areas adjacent to roads for travel corridors and security cover necessary to protect important habitat components. Three sight distances are desirable to provide visual security for grizzlies. A sight distance is the average distance at which a grizzly or other large animal is essentially hidden from the view of an observer by vegetation cover. The same security cover guidelines also applies to timber harvest units.
10. No off-duty work camps will be allowed within occupied seasonally important constituent elements.
11. Incinerate garbage daily or store in bear proof containers and remove to local landfill dumps daily.
12. Commercial activities permitted on public land should be planned and coordinated to avoid conflicts with grizzly bear trapping operations being conducted under the monitoring program. General public use of areas where trapping operations are active will be controlled through appropriate administrative actions by the agencies involved.

The following are grizzly bear management guidelines specifically oriented toward livestock grazing:

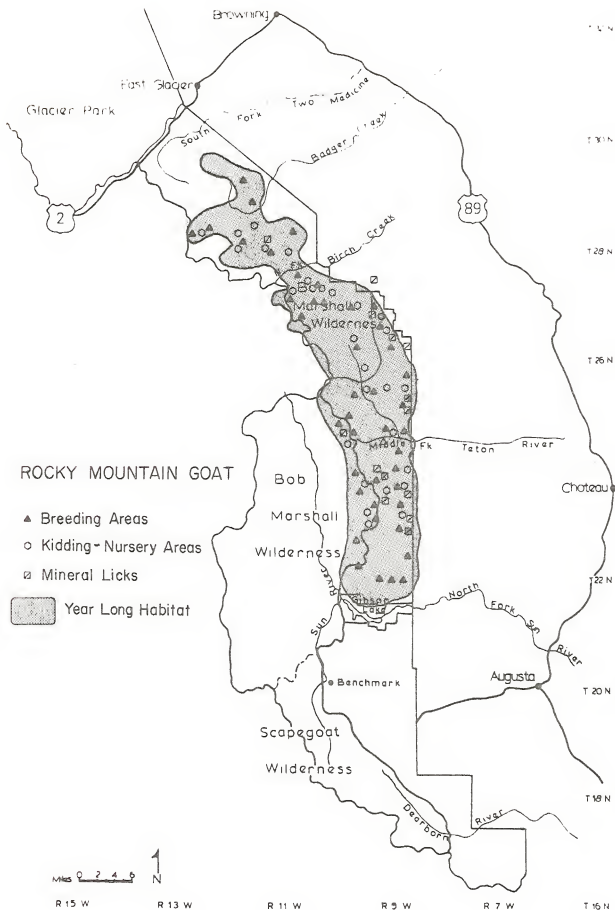
1. Livestock grazing on important spring habitat for grizzly bears should be deferred until after July 1.
2. Boneyards and livestock dumps are prevalent along the east front and are frequented by grizzly bears. Ranchers and landowners should be encouraged to place carcasses of dead livestock and garbage on remote areas of their land. Dead cows and calves should be hauled a considerable distance from calving grounds to discourage bears from feeding on carion and newborn calves.

3. Sheep grazing allotments in management situation No. 1, as defined in the Yellowstone Guidelines, on lands administered by government agencies should be eliminated.
4. In riparian habitats that receive high amounts of bear use, fencing to exclude livestock grazing and trampling may be necessary where livestock turn-out dates prior to July 1 are allowed.



# Rocky Mountain Goat







## Mountain Goat

The Montana Mountain Goat Investigations along the East Front of the Rocky Mountains, funded by the Montana Department of Fish, Wildlife and Parks, the Lewis and Clark National Forest and the Allen Foundation, is the basis for formulating management guidelines (Thompson 1980; Tomasko 1980; Joslin 1984, 1983, 1982, 1981). Literature concerning wildlife (primarily mountain goats) and land use conflicts was also used in developing some of the guidelines.

The guidelines are heavily oriented toward disturbance related to oil and gas activity since that is the primary activity of concern now, however, other activities which may influence mountain goats are also addressed. The following guidelines are based on historic information from this area and data collected during the last four years. These guidelines represent the best information now available.

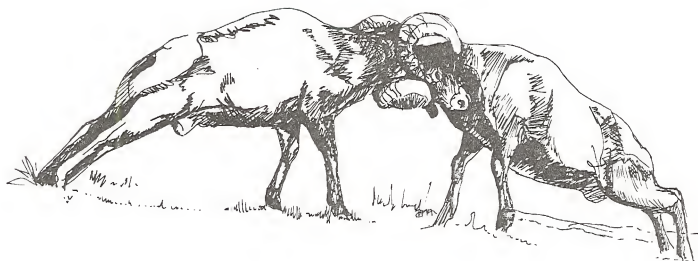
All previously mentioned "general management guidelines" are coordination measures that should be considered when evaluating human activities in mountain goat habitat. The following is adapted from the mountain goat investigations annual report (Joslin, 1984) and provides species specific guidelines which are applicable to a variety of human activities.

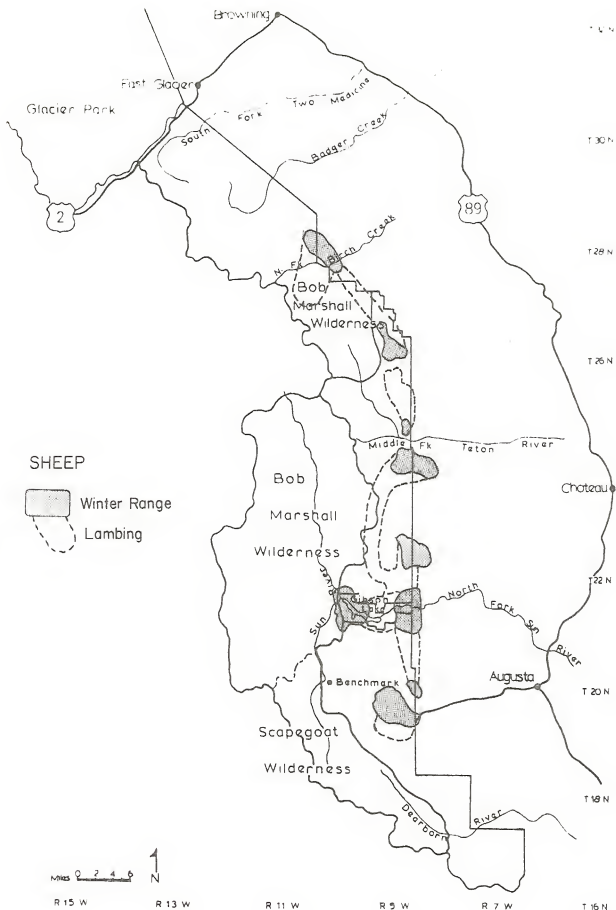
1. Avoid human activities in identified mountain goat habitat during the following seasonal use periods:
  - A. Occupied yearlong mountain goat habitat
    - 1) Kidding - nursery areas ----- May 1 - July 15
    - 2) Breeding areas ----- November 1 - December 31
    - 3) Winter range ----- October 15 - May 15
  - B. Suitable low occupancy mountain goat habitat  
(Appropriate surveys of suitable mountain goat habitat will be made by a wildlife biologist to determine whether goats are present prior to initiation of a planned activity. If goat use is documented, the stratification will be changed to occupied yearlong mountain goat habitat and the listed guidelines will apply. If mountain goat use is not documented, then guidelines listed for transitional areas will apply).
  - C. Transitional mountain goat habitat  
(The area between occupied yearlong habitat through which mountain goats travel. Timing restrictions apply to exploratory drilling, road construction and maintenance, timber harvest, off-road and trail vehicle travel, and any other mechanized activity which extends beyond one week in duration).  

----- October 15 - December 31  
and  
May 1 - June 30
2. Mineral licks used by mountain goats should have a no surface occupancy stipulation for a one-mile radius around the site (Joslin, 1984).
3. New mineral licks within mountain goat habitat should not be established without considering the safety of goats (Rideout, 1974).

4. Establish helicopter flight patterns at least one mile from mountain goat mineral licks during the May 1 - July 31 period (Joslin, 1984).
5. Restrict use of roads and trails which cross or come to within one-half mile of a mountain goat mineral lick to nonmotorized use during the May 1 - July 31 period.
6. Avoid constructing wells, pipelines or roads within 1 mile of occupied yearlong habitat.
7. Establish flight patterns in advance when activities require the use of helicopters. Flight patterns should be located to avoid seasonally important mountain goat habitat during the use periods designated above.
8. Exploratory well drilling should not occur within occupied habitat. Exploratory drilling on adjacent sites within Suitable and/or Transitional mountain goat habitat should be staggered to provide a disturbance-free area for displaced mountain goats.
9. Livestock use of mineral licks used by mountain goats should occur after July 1 or pasture use staggered so that adjacent licks are not used simultaneously by livestock.
10. In occupied yearlong habitat, livestock grazing should be restricted to the period July 1 - October 15.
11. The level of livestock use in occupied habitat should not be increased, and grazing of domestic sheep should not occur.
12. No suppression of insects and disease should occur in occupied habitat unless adjacent resource values are threatened.
13. Timber harvest and road construction within occupied mountain goat habitat should be closely coordinated with the Montana Department of Fish, Wildlife and Parks to address the needs of mountain goats.

# Bighorn Sheep





### Bighorn Sheep

The following guidelines are based on the best information available and are subject to change and/or modification. The majority of the guidelines are based on work done between Birch Creek and the Teton River by Andryk, 1983; between the Teton and Dearborn Rivers as part of the Rocky Mountain Front Wildlife Studies by Hook, 1981, 1982 and 1983; and on Region 4, Montana Department of Fish, Wildlife and Parks game management surveys.

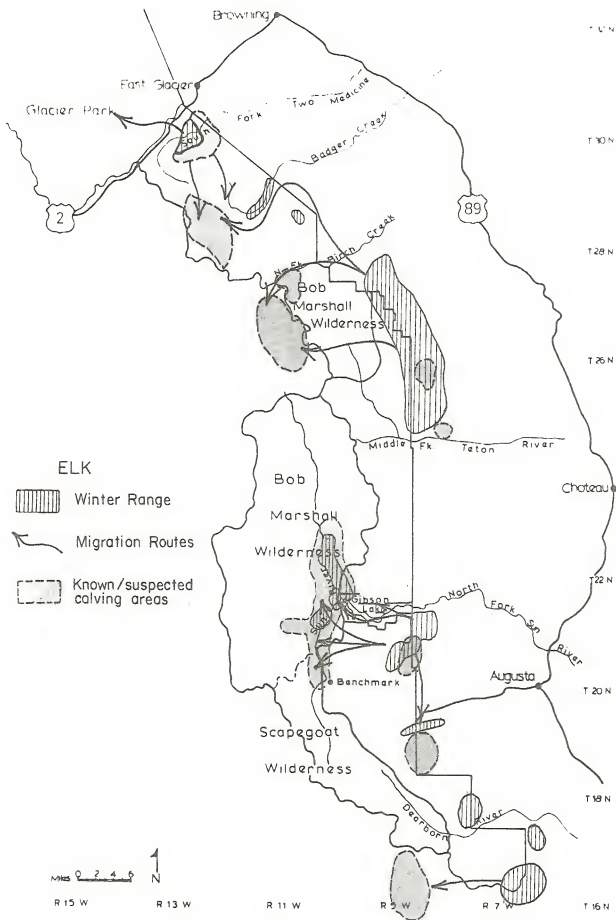
The cumulative effects of all disturbances; oil and gas exploration and development, timber harvesting, livestock grazing and recreation must be considered when evaluating proposed activities. Potential conflicts can be minimized by adhering to the following guidelines.

1. Avoid disturbance related to human activities on identified important bighorn sheep habitat during the following seasonal use periods:
  - A. Winter ranges and rutting areas ----- November 1 - May 15
  - B. Lambing areas and mineral licks ----- April 15 - June 30
2. Provide a one mile zone of no activity to separate each disturbance activity from an occupied bighorn sheep seasonal use area.
3. Require helicopters to maintain heights of not less than 1,300 feet (400 meters) from all ground surfaces, except in designated landing zones.
4. Avoid well drilling or pipeline construction within one mile of bighorn sheep winter ranges and rutting, lambing and mineral lick areas.
5. Avoid road construction within one mile of winter ranges and rutting, lambing and mineral lick areas, unless access is restricted during bighorn sheep seasonal use periods.
6. Restrict cattle grazing to the period of July 1 to October 15 on bighorn sheep habitat.
7. Continue to protect bighorn sheep winter-spring ranges from domestic livestock grazing.
8. Avoid timber harvest or firewood cutting on winter ranges and rutting, lambing and mineral lick areas during bighorn sheep seasonal use periods.



# Elk







## Elk

The guidelines described below are heavily oriented toward disturbance related to oil and gas activity (including seismographic work) since that is the primary activity of concern now. As the monitoring program proceeds, additional information will be gathered pertaining to other activities which may influence elk and elk habitat. We anticipate expanding the guidelines to address other disturbance related activities such as livestock grazing, hard rock mining, and increased recreation, etc. The Montana Cooperative Elk-Logging Study management recommendations and these guidelines will be followed as appropriate when considering elk and timber harvesting proposals.

The following guidelines are based on the best information available at this time and are considered tentative and subject to change. The majority of the guidelines are based on work done in the Badger-Two Medicine area of the Rocky Mountain Front by G. Olson (1981) in cooperation with the Rocky Mountain Front Wildlife Monitoring/Evaluation Program (1980). This report is also referenced for the "data summarization" portion of the elk guidelines.

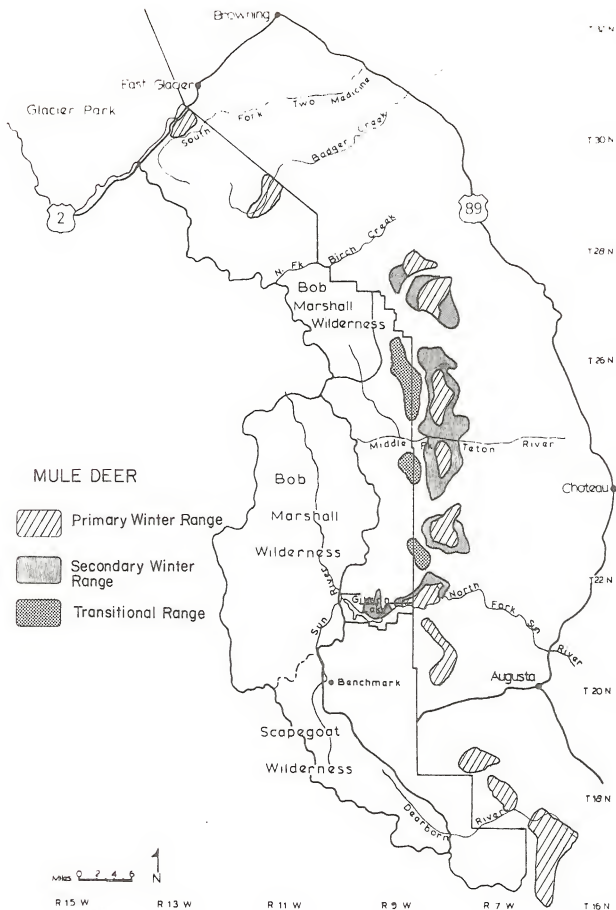
All previously mentioned "general management guidelines" are applicable coordination measures that should be considered when evaluating human activities in elk habitat. The following are additional species specific guidelines.

1. Avoid disturbance related to human activities on identified important elk habitat during the following seasonal use periods:
  - A. Winter ranges ----- December 1 - May 15
  - B. Calving areas and spring migration corridors -- May 1 - June 30
2. Increased levels of disturbance caused by human activities (i.e., seismographic surveys, timber harvesting, exploratory well drilling, etc.) should not be permitted to occur simultaneously in adjacent drainages within seasonally important elk habitat.



# Mule Deer





## Mule Deer

The East Slope Rocky Mountain Front Mule Deer Study and Investigation is the basis for formulating management guidelines. Other information available for developing guidelines includes Region 4 MDFW&P game management surveys and various surveys by the BLM and FS.

The guidelines are heavily oriented toward disturbance related to oil and gas activity since that is the primary activity of concern at present. We anticipate expanding the guidelines to other activities such as livestock grazing, recreational use and timber harvesting.

Studies to date have identified primary and secondary winter range, transitional range, migration corridors, and the tentative yearlong herd ranges associated with each wintering population unit. Population information applies only to units with winter ranges along the east slope from Montana Highway #200 to Birch Creek.

The following guidelines are based on the best information available at this time and are considered tentative and subject to change. We anticipate periodic updates as new data become available.

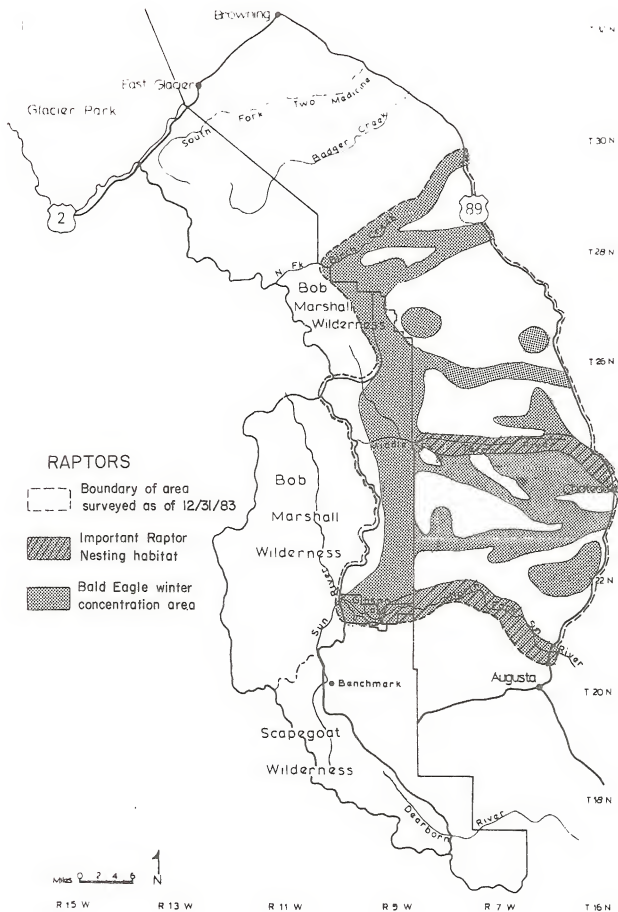
All previously mentioned "general management guidelines", unless specifically identified as inapplicable to mule deer, should be considered when evaluating human activities in mule deer habitat. The following are additional species-specific guidelines:

1. Avoid disturbance related to human activities on identified important mule deer habitat during the following seasonal use periods:
  - A. Primary and secondary winter ranges ----- December 1 - May 15.
  - B. Transitional ranges ----- October 15 - December 31.
  - C. Migration corridors ----- May 15 - June 15.
2. Population units should be closely monitored to detect changes in population size, productivity, mortality, and distribution associated with changes in land use. Intensive or high level monitoring of a population unit (with comparable monitoring of at least one other unit as a control) should be initiated if production density equals or exceeds one well per section on at least 25% of a primary, secondary, or transitional range or 10% of a high density primary winter range.



# Raptors







## Raptors

The raptor guidelines are based upon studies conducted in 1982 and 1983 by the Montana Department of Fish, Wildlife and Parks, and previous studies by the BLM, U.S. Forest Service, and The Nature Conservancy. They will be considered subject to revision as raptor studies and habitat inventories are continuing in the area.

Most of the information was collected in the area between Birch Creek and the Sun River. The area between the Sun River and Montana Highway 200 will be surveyed in 1984. Most of these guidelines are based upon reported impacts of activities on raptors and recommendations from the literature. This study has not been funded at a level to provide data on actual impacts related to human activities within the area surveyed to date.

1. Avoid human activities in seasonally important areas for raptors, including nesting, foraging and wintering areas.
2. To prevent lowered reproductive rates due to eggshell thinning, prohibit the use of chlorinated hydrocarbon pesticides.
3. To reduce accidental raptor mortality, prohibit the use of exposed poison baits or traps for predator control.
4. Raptor nest location information should be restricted to qualified researchers and appropriate personnel from the land management agencies directly involved.
5. Plan power and telephone line locations to reduce the possibility of raptor mortality from collisions.
6. Electrical transmission lines should be constructed or existing lines modified to reduce or eliminate the potential for large raptor electrocutions. Specific techniques and detailed design instructions are contained in "Suggested Practices for Raptor Protection on Powerlines - The State of the Art in 1981 (Raptor Research Report No. 4, Raptor Research Foundation, Inc., 1981)." Copies may be obtained for \$5.00 from Raptor Research Foundation, Department of Veterinary Biology, University of Minnesota, St. Paul, Minnesota 55108.

Type 1. Areas occupied by nesting bald eagles or peregrine falcons:

No endangered raptor species are known to nest on the Rocky Mountain Front. Should nesting peregrine falcons or bald eagles be discovered, a site specific nest management plan should be developed. These guidelines were developed by the Greater Yellowstone Ecosystem Bald Eagle Working Team (1983). Guidelines developed by the Montana bald eagle and peregrine falcon working groups should be used when they are completed.

1. Nesting season (February 1 - July 31)
  - A. Prohibit human activities within 800 meters of occupied nests, with the exception of existing low level activity such as hiking trails and necessary surveys by qualified biologists.

- B. Prohibit helicopter or jet overflights within the Nesting Zone (400 meters) and restrict overflights to above 600 meters in the Primary Use Area (400-800 meters).
2. Non-nesting season (August 1 - January 31)
  - A. Human activities that do not degrade nesting and foraging habitat are permitted within 800 meters of the nest. These include dispersed recreation and properly - conducted seismic exploration.
  - B. Housing developments, exploratory drilling, heavy construction, additional campgrounds and boat landings, and other activities which degrade habitat quality of increase human activity levels are prohibited within 800 meters of bald eagle and peregrine falcon nests.
  - C. Prohibit all timber harvest within 800 meters and in important foraging habitat within 4 kilometers of bald eagle nests, including firewood cutting, snag removal, and thinning.
  - D. Timber harvest may be permitted within 800 meters of peregrine falcon nests during the non-nesting season if a site evaluation determines no detrimental impacts on the peregrines. Associated roads should be closed and reclaimed upon completion of the harvest.
  - E. Habitat alterations within 400 meters of bald eagle and peregrine falcon nests should be restricted to projects specifically designed to maintain or enhance bald eagle or peregrine falcon habitat.
  - F. Power and telephone lines should not be constructed within 800 meters of bald eagle or peregrine falcon nests. Existing structures should be modified if they pose a hazard to raptors.

Type 2. Potential nesting habitat for bald eagles and peregrine falcons:

1. Prohibit disturbing human activities within 800 meters of historic nest sites during the nest site selection period (February 1 - April 30).
2. Prohibit human activities that cause habitat loss or an increase in human activity within potential nesting habitat. This includes additional campgrounds and boat landings, housing developments, oil and gas fields, and additional roads.

Type 3. Areas occupied by nesting special interest species including the golden eagle, northern goshawk, ferruginous hawk, prairie falcon and merlin (Flath, 1981).

Management goals are to protect occupied nest sites from disturbance and maintain habitat quality.

1. Prohibit human activities that have the potential to disrupt nesting activities within the dates and buffer zones listed below:

Species	Approximate Dates of Nesting Season	Recommended Buffer Zone (Meters)
Golden Eagle	February 1 - July 30	600 m
Northern Goshawk	April 15 - August 15	400 m
Ferruginous Hawk	April 1 - July 30	600 m
Merlin	April 15 - August 15	500 m
Prairie Falcon	February 15 - July 30	500 m

The buffer zones may be adjusted to allow for topographic features which offer screening from disturbance, or for less tolerant individual raptors, but buffer zones should not be less than 300 meters in any case. Types of activities which should be restricted include heavy construction, timber harvest, exploratory drilling, seismic exploration, and helicopter flight patterns.

2. Activity patterns that have been established for at least three years can continue within buffer zones at current levels. These include established roads, pack trails, campgrounds, and dwellings.
3. Timber harvest, including firewood cutting, snag removal, and thinning should be prohibited within 300 meters of goshawk nests yearlong.

Type 4. Potential nesting habitat for the northern goshawk, prairie falcon, golden eagle, merlin, ferruginous hawk, Swainson's hawk, red-tailed hawk, northern harrier, and great horned owl.

1. Employ timber harvest levels and rotation periods which maintain and regenerate current levels of mature to overmature stands of conifers.
2. Avoid placing roads, drill pads, campgrounds, and other habitat disrupting developments in potential nesting habitat.

Type 5. Areas not used for nesting (includes foraging and wintering areas).

1. Prohibit disturbing human activities such as heavy construction seismic exploration, exploratory drilling, and timber harvest in bald eagle winter concentration areas from December 1 - April 15.
2. Prohibit disturbing human activities in important foraging areas.
3. Reclamation of areas disturbed during development should be designed to enhance prey populations.



# DATA SUMMARIZATIONS

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## Grizzly Bear Monitoring Data Summarization

### Rocky Mountain Front Area

#### Management Objectives

Under authority of the Endangered Species Act, the grizzly bear (*Ursus arctos horrisilis*) was listed as a threatened species by the United States Fish and Wildlife Service in 1975. In 1981 a Grizzly Bear Recovery Plan was adopted. This plan presents a biologically sound program that will result in the recovery of the species to a population level that would no longer require protection under the Endangered Species Act. Objectives for a recovered population as outlined in the plan are:

- |                        |                |
|------------------------|----------------|
| (A) Reproductive rate  | 0.524 to 0.676 |
| (B) Cubs per female    | 1.78 to 2.3    |
| (C) Reproductive cycle | 3.4 years      |

Human activities within grizzly bear habitat will have effects, however subtle, on grizzly bears. Impacts of humans and their activities on bears has been well documented in the literature. Human activities which can affect grizzlies and/or their habitat need to be designed to provide for the grizzly bears need and minimize grizzly-human conflict situations. Successful management of grizzlies will be dependent upon our knowledge of the animal, a keen understanding of the effects of human activities on grizzlies, and our sensitivity as land managers toward the species concerned.

#### Populations and Densities

Glacier Park estimates an average population density of one grizzly bear per eight square miles. Other areas in the Northern Continental Divide Ecosystem indicate a grizzly population density of one bear per fifteen square miles as an average.

Grizzly bear density within the Rocky Mountain Front study area from 1980-83 ranged between one bear per 11.5 square miles during the spring and one bear per 22.2 square miles during the fall. A year-long average density is about one bear per 16.3 square miles. There are approximately 1800 square miles in the Rocky Mountain Front area, not counting the Blackfeet Reservation. This is based on Schallenger's essential habitat delineation. Using the above population densities, a population of between 82 and 157 animals is possible. An average density for the past three years of study is one bear per 16.3 square miles. This suggests a population of about 110 grizzlies. Servheen (1980) reports an average density of one bear per 19 square miles for the entire Northern Continental Divide Ecosystem. Using this conservation density estimate, a population of 95 animals appears appropriate. Given land ownership and historic land uses, a population range of 95-110 appears to be most appropriate. This is an estimate and subject to change in either direction.

Densities of bears in the Antelope Butte, Ear Mtn.-Pine Butte, and Elk-Smith Creek areas may occasionally be as high as one grizzly per one to two miles squared for brief periods as bears concentrate on key spring ranges.

Further discussion of populations and densities are presented in Schallenber and Jonkel (1980) and Aune and Strivers (1982, 1983).

### Habitat

Management stratifications and various habitat mapping systems are being developed and used by land management agencies on the Rocky Mountain Front.

Management stratification mapping using the Yellowstone Guidelines has shown that all federal and state controlled lands falling within occupied grizzly habitat along the Rocky Mountain Front meet the criteria to be classified under Management Situation 1. Management Situation 1 is defined below:

#### A. Management Situation 1

1. Population and habitat conditions. The area contains grizzly population centers (areas key to the survival of grizzlies where seasonal or year-long grizzly activity, under natural, free-ranging conditions is common\*) and habitat components needed for the survival and recovery of the species or a segment of its population. The probability is very great that major Federal activities or programs may affect (have direct or indirect relationships to the conservation and recovery of) the grizzly.
2. Management direction. Grizzly habitat maintenance and improvement (improvement applies to Forest Service only), and grizzly-human conflict minimization will receive the highest management priority (FSM 2603). Management decisions will favor the needs of the grizzly bear when grizzly habitat and other land use values compete. Land uses which can affect grizzlies and/or their habitat will be made compatible with grizzly needs or such uses will be disallowed or eliminated. Grizzly-human conflicts will be resolved in favor of grizzlies unless the bear involves is determined to be a nuisance.\* Nuisance bears may be controlled through either relocation or removal, but only if such control would result in a more natural free-ranging grizzly population and all reasonable measures have been taken to protect the bear and/or its habitat (including area closures and/or activity curtailments).

Constituent element maps are developed for much of the Rocky Mountain Front occupied grizzly habitat. Constituent elements are areas which include combinations of biological and physical factors that are considered essential for the recovery and conservation of a threatened or endangered species (Endangered Species Act, 1973). Grizzly bear constituent elements are: Denning habitat, Spring habitat, Summer habitat, Fall habitat, and space. The year-long needs of grizzly bears can be met when all constituent elements are adjacent to each other and accessible to grizzly bears in the area. Many major developments and management actions can reduce the availability of any of the constituent elements.



Seasons of use for constituent elements are:

Spring habitat	April 1 - June 30
Summer habitat	June 15 - Sept. 15
Fall habitat	Sept. 1 - November 30
Denning habitat	October 15 - April 15

Another possible constituent element for grizzly bears are breeding areas. Evidence suggests that breeding ranges may be synonymous with spring range in most instances, but some females chose secluded breeding areas outside of spring habitat which are then of critical importance to them. Breeding areas are important from May 1 to July 15. Some breeding ranges have been identified and mapped for the Rocky Mountain Front.

Grizzly bear habitat components are structurally based descriptions of sites that can be consistently recognized and have a structural or vegetative identity value to grizzly bears. Habitat components have been mapped for some areas of occupied grizzly habitat in the Northern Continental Divide Ecosystem. These are refined high resolution maps providing detailed, site specific habitat information pertaining to grizzly bears. Important habitat components for the East Front Region have been defined by radio telemetry studies conducted since 1977. Many components are important seasonally while others are used year around. Figures 1, 2, and 3 present the seasonal use of habitat components by grizzly bears on the Rocky Mountain Front.

Many high use areas on the Rocky Mountain Front have been identified from radio telemetry studies. These areas may hold special significance to grizzly bears of the mountain front because of the juxtaposition and spatial arrangement of habitat components. These areas are not necessarily distinct and may join unidentified high use areas or interchange of animals may occur between these use areas. The following important grizzly use areas have been identified since 1976.

(A) Ear Mtn.-Pine Butte	Sp/Su/fall
(B) Antelope Butte-Dupuyer-Walling Reef	Sp/Su/fall
(C) Elk-Blubber-Smith Creeks	Sp/Su/fall
(D) Sheep Mtn.-Harrison Basin	Su/fall
(E) Elk Hill-Biggs Creek	Sp/fall
(F) South Fork Two Medicine-Badger area	Sp/Su/fall
(G) Teton River-Sun River Divide	Su/fall

Travel Corridors

Travel corridors between and within the identified grizzly bear use areas and between constituent elements area very important. The following discussion by C. Jonkel in BGP Special Report No. 30 (Chicago Peak Developments) is appropriate.

"Travel corridors may lead to seasonal or alternative feeding areas, or they may connect major bear ranges across developed lands. The seasonal corridors are predictable and more easily located through bear observation or radio-tracking. Bears, like other species, will select areas with cover when traveling, be it only the occasional fence post, a draw, or a stream channel. Seasonal grizzly ranges are often interspersed with ranch or farming lands, or lie outside contiguous grizzly range, requiring that the bears travel past or near to people and their livestock."

#### Data Display and Storage:

The standard base map for the monitoring study will be 1:24,000 USGS quads with:

- Lewis and Clark Forest Land types
- BLM habitat study types (from Pfister, et. al., 1977 and Mueggler, 1980)
- Department of Natural Resources type delineations
- Habitat components as they are mapped

The 1:24,000 quad series will serve as the standard basic work map. It was also felt to be the most appropriate scale to use for evaluation of specific project proposals.

Annual summaries of radio monitoring and other observation data by individual species will be placed on overlays using the 5/8 inch to 1 mile BLM minerals map series as a base. Overlays depicting past and on-going activities such as timber harvest, recreation development and use, subdivision, etc. will also use this base for the area where map coverage is available. The northern portion of the Lewis and Clark Forest is not currently covered by the BLM minerals map series. Overlay data for that area will be placed on the 1/2 inch to 1 mile Forest Service visitors map until BLM map coverage is available.

Figure 1. Spring use of habitat components by grizzly bears 1977-82.

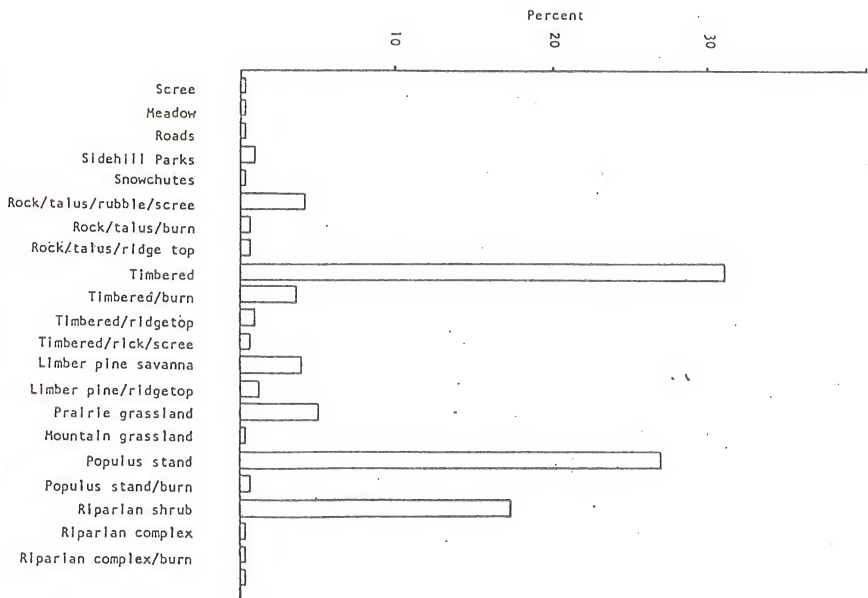
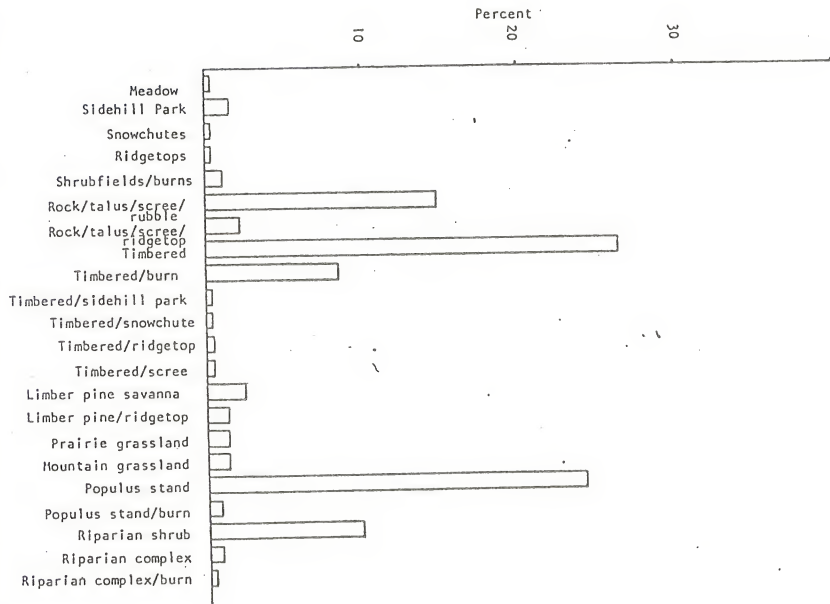


Figure 2. Summer use of habitat components by grizzly bears 1977-82.



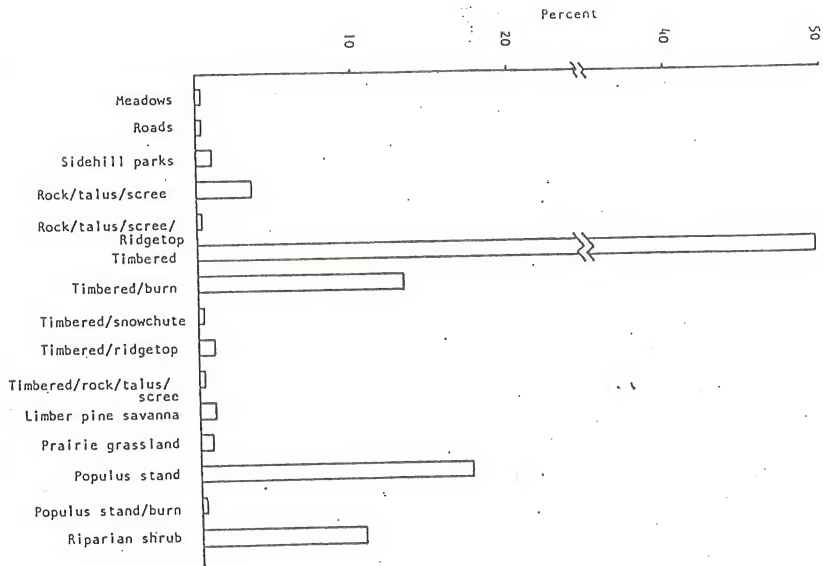


Figure 3. Fall use of habitat components by grizzly bears 1977-82.

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Mountain Goat Investigations Data Summarization  
Rocky Mountain Front

HABITAT USE

Seasonal Distribution

Over 1500 observations of mountain goats were used to develop seasonal range use maps (Figures 1 through 19). The study area boundary, outlined on the distribution maps, describes the area which is annually surveyed. Within this areas, all country above 1829 meters (6000 feet) occurring on slopes of 70 percent or greater are classified as known (number one on maps) or probable (number two on maps) use areas based on habitat selection data described previously. There is little definable difference between summer and winter habitat selection, so these seasons were combined. Known kidding-nursery areas are identified with an N in Figures 3 through 19. Kidding-nursery areas are noted on the map if a solitary female was observed during May or June or if a group of goats which contained a kid was observed during June, July or August. Mapped information is more restrictive than the information used to analyze kidding-nursery areas because in the analysis, September observations of groups with kids were included to round out the summer season. Future delineation of nursery areas should include September data. Known breeding areas are identified with a B in Figures 3 through 19. All observations of adult (2½ years of age and older) males and females during November and December were used to delineate breeding areas.

Kidding-Nursery Areas

Kidding-nursery areas occurred on all aspects and terrain types and most slopes and elevations within the study area. Generally they occur on east and northeast exposures on slopes of 90 percent or greater; between 2134-2438 m (7000-8000 feet) elevation; on land types 202, VI, 171 and 182; in all terrain types and on the crust, forest, parkland, short grass and brush vegetation types.

Summer Areas

Summer areas occur on all aspects and terrain types and most slopes, elevations and vegetation types within the study area. Summering areas tend to occur on east and northeast exposures; on slopes of 70 percent or greater; at elevations of between 2134-2438 m (7000-8000 feet); on land types 202, VI, 171 and 182.

Breeding Areas

Breeding areas occur on all aspects and elevations within the study area, but tend to occur on southeast and east exposures; on slopes of 90 percent and greater; at elevations of 2134-2286 m (7000-7500 feet); on land types 202, VI, 182 and 171; on cliff and bluff terrain types; and crust, forest, parkland and krummholz vegetation types.

#### Winter Areas

Winter areas occur on all aspects but favor south, southeast and east; on slopes of 70 percent or greater; at most elevations but generally below 2286 m (7500 feet); on land types 202, VI and 182; on all terrain types but primarily cliffs, talus and ridges; on all vegetation types but particularly crust, forest and parkland.

#### Mineral Licks

Eleven mineral licks are known to occur within the study area (Figures 10, 11, 14, 16, 17, and 19). The Walling Reef and Headquarters Pass licks may be natural mineral licks, but the other nine are artificially established sites. The Blackleaf, South Fork Dupuyer, Walling Reef, Our Lake, Headquarters Pass, North Fork Deep Creek and Frenchy Gulch sites are regularly used by goats. The South Fork Deep Creek lick is occasionally used. The degree of use of the Blindhorse, Walling-Split Mountain and Erosion Gulch licks is not known.

Mountain goats will use salt during all months of the year (DeBock 1970). Males tend to use licks during May, June and early July. Females generally do not begin using licks until after the kids are born in June, but they continue to use them into September.

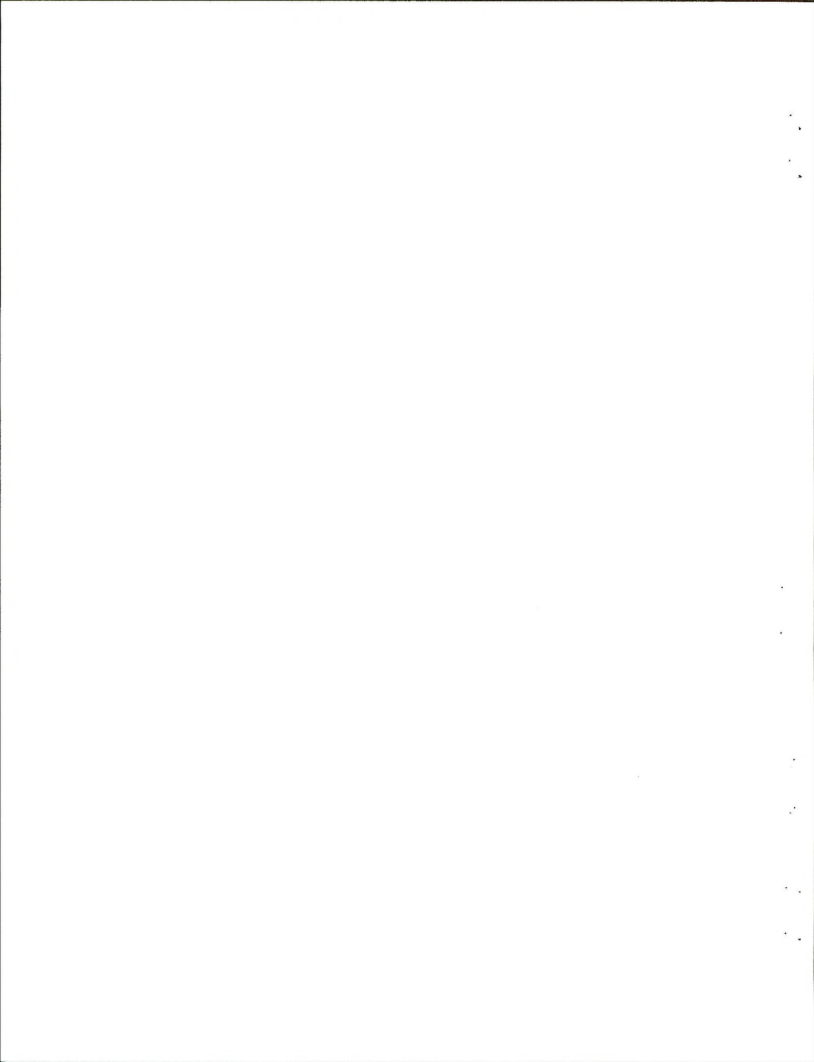
In using licks, most ungulates are seeking sodium bicarbonate (Stockstad 1953 and Smith 1954). Hebert and Cowan (1971) indicate that there is a sodium imbalance in the diet of mountain goats during spring since the diet has shifted from dry winter forage to lush green forage which tends to flush the system of essential nutrients.

The mountain goats' desire for salt is strong and will lead them into unsafe surroundings out of normal mountain goat habitat, away from escape terrain. These circumstances will develop if artificial lick sites are established near the fringes of mountain goat habitat. Rideout (1974) hypothesizes that mountain goats will risk predation to satisfy their drive and need for salt.



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Bighorn Sheep Monitoring Data Summarization  
Rocky Mountain Front

Management Objectives:

Human activities which can affect sheep and/or their habitat need to be managed to provide for Bighorn needs and minimize sheep/human conflicts.

The Sun River Bighorn sheep population is the largest herd in the contiguous United States. There are four major herd segments found in the Ford Creek, Sun River, Deep Creek and Ear Mountain areas. This population has increased from an estimated 260 head in 1943 (Couey, 1950) to approximately 1,000 head in 1983.

The Management objectives are to maintain a minimum countable population of 800 head which is considered compatible with winter range carrying capacity. This would be made up of approximately 200 head on each of the four major wintering areas.

Habitat:

Bighorns make use of three major habitat types. They are bunchgrass, rocky reef and old burns. Habitat types that have been influenced by past fires and are in close proximity to rocky terrain are of great significance for this species. The sheep make greater use of the bunchgrass type during the spring through the lambing period. They also make a seasonal migration to higher elevations during summer. Erickson (1972) found mean winter elevations of 5,045 feet while that in summer was 6,508 feet. Recent radio telemetry data has shown extensive movements about the summer range from rocky ridges to bunchgrass plateaus until the onset of winter.

Data Display and Storage:

To date nine Bighorn sheep have been radio collared in the study. Data from two years of monitoring has been collected and is being analyzed. These locations are being plotted of 1:24,000 USGS quads. Various data such as UTM coordinates, elevation, slope, aspect, habitat type, topography, USFS Land form, etc., have been computer coded and are being run through Geoscan and Teldane programs. These data are being stored on computer files at Montana State University. Individual home ranges and seasonal distribution maps have been generated. These data will be overlaid on USFS  $\frac{1}{2}$  inch to the mile maps for interagency use.

Human disturbance factors such as seismic activity are being statistically compared to individual movement patterns and will be documented in annual progress reports.

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Elk Monitoring Data Summarization  
Rocky Mountain Front

Four radio collared cow elk were monitored throughout the spring, summer, and fall, 1981, to assess the effects of geophysical exploration on their distribution in the Badger Creek - South Fork Two Medicine River area of northcentral Montana. For comparison, movements of two radio collared elk summering in the Middle Fork Flathead drainage (where no seismic activity took place) were also monitored.

Seismic methods employed were mainly surface blasting with one line by porta-drill. Helicopters were used to transport men and equipment. A total of seven seismic lines were surveyed through the study area during August, September, and October by Seisdata Services, Inc., SEFEL Company, and Mountain Geophysical Corporation.

As helicopter and blasting activity proceeded eastward, elk generally began moving back into the drainages occupied before exploration began. No locations were noted in direct line of sight of seismic work, rather the elk preferred to remain at least one ridge or drainage from the disturbance, mostly in heavy timber cover.

Based on average distances moved between flights for radio collared elk along the Middle Fork Flathead River in the Great Bear Wilderness, the Two Medicine group moved at least 50% more between observations.

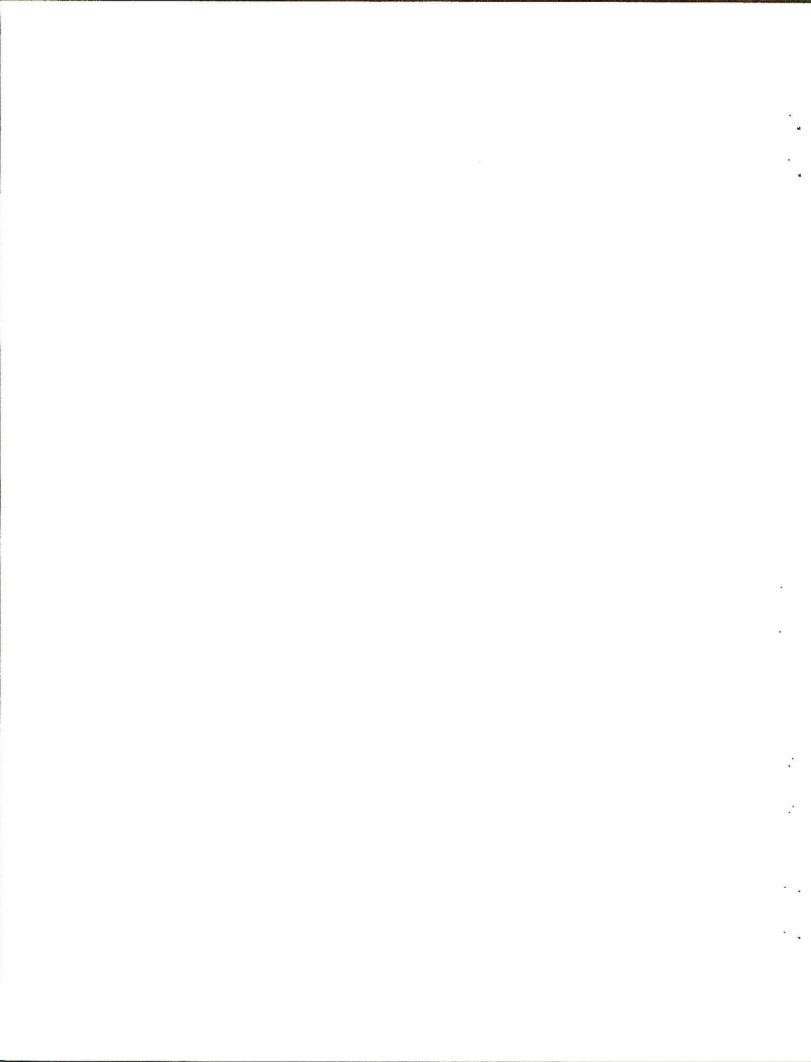
Another collared elk which summered in Glacier National Park moved over a steep pass into an adjacent drainage approximately the same time as seismic work began in the South Fork Two Medicine valley. Her average movements between locations for the summer-fall period were much the same as the Middle Fork Flathead elk.

Levels of activity in winter similar to that of this summer may cause severe physiological stress on the South Fork Two Medicine herd. Forced movements to marginal winter range may disrupt reproductive processes and nutritional balances. The net effect could be calf losses and death of weaker segments of the herd structure.

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## Mule Deer Monitoring Data Summarization Rocky Mountain Front

Mule deer monitoring studies completed to date have been carried out by the Montana Department of Fish, Wildlife, and Parks through two graduate student studies conducted by Montana State University. Monitoring following those studies has been conducted by MDFW&P and MSU personnel. The BLM has provided a major portion of the funding, but supplemental funds were provided by MDFW&P, USFS, and industry grants.

Information collected is available in two theses (Kasworm 1981, Ihsle 1982), four annual reports to the BLM (Kasworm and Irby 1980, Kasworm et al. 1981, Mackie and Irby 1982, Irby and Mackie 1983), a MDFW&P report to the USFS (Hook et al. 1982), and MDFW&P Job Progress Reports (McCarthy et al. 1980-1982). Those persons interested in more detailed information should consult these sources.

### Mule Deer Study Objectives

1. To determine the seasonal distribution, movements, and habitat usage of mule deer on a representative portion of the Rocky Mountain Front range subject to mineral exploration and development.
2. To determine mule deer population status and trend on the study area and/or portions thereof, including any identifiable herd segments of units.
3. To identify and describe seasonally important range areas and vegetation types used by mule deer on the Rocky Mountain Front.
4. To identify and/or provide bases for future quantitative evaluation of mule deer range use, populations, and habitat responses to disturbance and other activities associated with mineral exploration and development and/or other land use management practices on the Rocky Mountain Front range.

### Seasonal Distribution

Winter Ranges - Aerial and ground survey information accompanied by observations of marked animals and radio relocations led to the designation of seven winter ranges. Six of these were occupied at the beginning of the study and the seventh, Swanson's Ridges, was occupied during the course of the study and probably represents either an extension of the Dupuyer WR or a separate range occupied at moderate to high mule deer population levels. Locations of the ranges are given on the attached maps. Approximate sizes (primary +secondary) are given in Table 1.

Table 1. Identified mule deer winter range, Sun River to Birch Creek. Approximate total winter range area and tentative herd range areas (based on radio-relocations and neckband sightings through 1982) are given.

Winter Range	Total Winter Range (km <sup>2</sup> )	Tentative Herd Range (km <sup>2</sup> )
Scoffin Butte	26.6	580
Dupuyer Creek	31.6	360
Swanson's Ridges	29.2	a
Blackleaf-Teton	80.8	330
Ear Mountain	44.0	380
Long Ridge	37.6	a
Castle Reef	38.9	1060

a No marked animals were available for herd range estimation.

Individuals maintained high fidelity to winter ranges. All radio-collared and all but three neckbanded individuals known to have returned to winter range, returned to the winter ranges on which they were captured.

Transition Ranges - Several areas used by mule deer as transitional range were identified and are delineated on the attached map. Animals which summer west of the Continental Divide appear to move to transition areas east of the divide with the first major fall storms. The major use of transition ranges is during October-December when they apparently provide a measure of security during hunting season. Spring movement (May-June) routes pass through the transition areas indicating that these areas may serve as fawning sites for some does.

Migration Corridors - Radio tracking data indicates several major drainages and passes as being important migration corridors. These drainages and corridors are shown on the attached Rocky Mtn. Front Mule Deer/Elk map.

Summer Ranges - The association of summer ranges with each winter range has been tentatively identified from radio-relocations, marked animal returns, and sightings of neckbands. Summer range fidelity appears to be quite high. Fifteen out of 16 radioed females for which two years or more of data are available used the same summer ranges each year. Of 22 radioed deer, 27% summered west of the Continental Divide, 14% summered along the mountain front, and 59% summered in drainages between the divide and the mountain front. The low numbers of mule deer wintering west of the study area strongly suggest that population units occupying East Front winter ranges include most of the deer summering in the portion of the Bob Marshall Wilderness, Lewis and Clark National Forest, and Flathead National Forest lying north of the Sun River, south of Glacier National Park, and east of the upper South Fork of the Flathead River.

#### Population Dynamics

Population Estimate and Trend - The available information suggests that the mule deer population in the study area increased from 1975-1983. Helicopter counts during this period gave erratic results (Table 2) but

distributional changes (i.e., increases in areas reported occupied by deer in winter) and impressions of personnel familiar with the area supported this contention. Helicopter surveys during years in which sufficient numbers of marked animals were available for use of the Lincoln Index (Table 2) and regression analyses used to adjust helicopter counts for differences in weather and snow conditions (Irby, unpubl. data) also indicated a steady increase.

Number of deer counted along the Rocky Mountain Front (Sun River to Birch Creek) may not represent a firm basis for a total population estimate since deer captured and marked for the Lincoln Index were taken primarily from the subpopulation which tended to stay on the lower winter range areas during mild to moderate (1981 and 1980 samples, respectively) winter conditions, but the derived population estimates were representative of a major portion of the population and showed (based on March estimates) increases of 6% between 1980 and 1981 and 2% between 1981 and 1982 (Table 2).

Table 2. Results of helicopter surveys of mule deer on winter ranges, Sun River to Birch Creek. Population estimates based on the Lincoln index approach are given for 1980-82.

Date	Winter/Snow Conditions	South of Teton	North of Teton	Total	Population Estimate
Feb 1975	Severe	1687	1157	2842	
Feb 1978	Moderate	1740			
Feb 1979	Severe	2003	1529	3532	
Apr 1979	Moderate	1318	964	2282	
Mar 1980	Moderate	2015	1473	3488	5653
Apr 1980	Moderate	1261 <sup>a</sup>	1460		
Mar 1981	Mild	1840	1559	3399	6014 <sup>b</sup>
Apr 1981	Mild	1015	1291	2306	4838 <sup>b</sup>
Jan 1982	Severe	2562	2531	5093	
Mar 1982	Mild	1383	1947	3330	6110
Jan 1983	Mild	1075 <sup>c</sup>	1678	2753	

<sup>a</sup>Long Ridge WR not counted.

<sup>b</sup>Many animals had dispersed onto transition range at the time of the count.

<sup>c</sup>Part of the Long Ridge WR was missed and many animals had not moved from transition to winter range.

(Results from helicopter surveys indicated that trapping and marking of deer should be undertaken every two years if the Lincoln Index is to be used. This trapping frequency could probably be reduced to once/ 3 yrs. if fulltime personnel were available to monitor (i.e., identify marked individuals prior to surveys) winter ranges intensively.)

Production - Early to mid-winter fawn; doe ratios (Table 3) were generally near or above long-term averages throughout the 1980-83 period. Late winter ratios in 1980-82 were consistent with those expected in a healthy herd. Ground observations during 1980-81 on five winter ranges showed no statistical differences in productivity (fawn:does or adult ratios) among winter ranges. Helicopter survey data indicate that buck percentages in the population may be declining slightly south of the Teton and increasing north of the Teton, but too few data are available to interpret this apparent trend.

Table 3. Early-mid winter fawn to adult ratios on mule deer winter ranges, Sun River to Birch Creek.

Hunting District	N/100 Adults				
	MDFW&P 1961-79 <sup>a</sup> (x + SD)	1980 <sup>b</sup>	1981 <sup>b</sup>	1982 <sup>c</sup>	1983 <sup>c</sup>
H.D. 441 (north of Teton River)	51 + 14	71	50	53	49
H.D. 442 (south of Teton River)	53 + 12	69	53	40	56

a Ground observations, December-March

b Ground observations, January-February

c Helicopter observations, January

Age and Sex Structure of Population (hunting kill and post-hunting live) - Data collected at two check stations on the Teton and Blackleaf roads during 1980 indicated 61% of the mule deer harvest was male. Forty percent of deer captured during post-season helicopter drive net operations in 1980 and 1981 were male. Age distribution of harvested mule deer consisted of 16% fawns, 54% yearlings, and 30% 2+ years. Captured deer had an age structure (average of 1980 and 1981) of 29% fawns, 12% yearlings, and 59% 2+ years.

#### Habitat

Cover type maps of winter concentration areas, low use zones, transition areas, and summer ranges of radio-collared animals have been prepared and are available at the Great Falls BLM office. Important habitat types identified on winter range include:

#### Cover and forage areas

Limber pine/Rough fescue (*Pinus flexilis*/*Festuca scabrella*)  
Limber pine/Juniper (*P. flexilis*/*Juniperus* sp.)

Feeding sites (use of these sites is increased when in close proximity to the preceding types)

Shrubby cinquefoil/Rough fescue (Potentilla fruticosa/F. scabrella)  
Rough fescue/Idaho fescue (F. scabrella/F. idahoensis)  
Rough fescue/Bluebunch wheatgrass (F. scabrella/Agropyron spicatum)  
Big sagebrush/Rough fescue (Artemisia tridentata/F. scabrella)  
Wet meadow  
Riparian  
Swamp

Topographic Character - Winter ranges differed from adjacent low use areas in that winter ranges were consistently lower in elevation, had a wider availability of aspect classes, and had a greater percentage of the total land surface in moderate and steep slope categories. Although analyses are still incomplete, high density winter ranges appear to differ from low density winter ranges primarily in elevation. High density winter ranges were situated in areas that allowed mule deer to move to relatively low elevations and still find broken terrain, favorable cover conditions, and aspect/slope configurations that promoted snow melt during chinook conditions.

#### Gas and Oil Impacts

Impacts of oil and gas exploration were difficult to assess during the intensive phase of the study due to the low level of activity, the mild winter conditions, and the low density of deer in the vicinity of active well sites. The limited data available showed no obvious avoidance by radio-collared deer in the vicinity of the Blackleaf well sites and no apparent long-term change in home ranges of radioed animals exposed to seismic activity.

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## Raptor Monitoring Data Summarization Rocky Mountain Front

### Sources of Information:

Short-term raptor surveys were previously conducted by the U.S. Bureau of Land Management (Gramlich 1979), U.S. Forest Service (Schallenger 1975) and the Nature Conservancy (Crenshaw 1979). Wenzel (1982) gathered raptor information incidental to other work for the U.S. Bureau of Land Management. The present survey, funded by U.S. Fish and Wildlife Service, was initiated in December 1981 (DuBois 1983, 1984).

### Objectives of the Study:

1. Determine distribution, abundance, and habitat use of the raptor species found on the Rocky Mountain Front.
2. Describe nesting habitat and productivity of nesting raptors.
3. Delineate suitable nesting habitat for the bald eagle and peregrine falcon, regardless of current occupancy.
4. Delineate winter concentration areas for bald eagles.
5. Determine responses of raptors to human activities, when possible.

### Nesting Population Density:

The total nesting population was estimated to be about 271 pairs (16 species) in the area covered, or a density of 9.5 pairs per 100 square kilometers. Nesting densities for species of special interest to state and federal agencies (Flath 1981) were: golden eagle - 0.7, prairie falcon - 1.1, merlin - 0.1, ferruginous hawk - 0.3, and northern goshawk - 0.2 pairs per 100 square kilometers. No nestine bald eagles or peregrine falcons were located, though suitable nesting habitat is present for both.

### Nesting Habitat:

Cliff and riparian habitats were the two most important habitats for nesting raptors. Approximately 151 kilometers of cliffs were present, or about 0.5 percent of the study area. Cliffs provided nesting habitat for all of the prairie falcons, 87 percent of the golden eagles, and a small percentage of red-tailed hawks, ferruginous hawks and great horned owls. Riparian habitat covered only 5.4 percent of the study area, yet provided nesting habitat for 96 percent of the Swainson's hawks, 93 percent of the red-tailed hawks, 60 percent of the great horned owls, and 4 percent of the golden eagles. The northern harrier, American kestrel, saw-whet owl, and western screech-owl were suspected to nest primarily in riparian habitat.

#### Bald Eagle Winter Concentration Areas:

The wintering bald eagle population was estimated to be no more than 15 birds on the Sun River - Elk Creek area near Augusta and 5 birds on the Teton River near Choteau during the winter of 1981-82. Few bald eagles were observed during the winters of 1982-83 and 1983-84, possibly due to the unusually mild weather.

#### Responses of Raptors to Human Activities:

Observation of reactions of raptors to human activities were limited, so information from the literature was heavily used in the formulation of the guidelines, including GYE Bald Eagle Working Team (1983), Ellis (1982,1981), Suter and Jones (1981), Becker and Ball (1981), Thurow et al. (1980), Call (1979), and Fyfe and Olendorff (1976).



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Procedure to Add or Revise a Rocky Mountain Front Interagency Wildlife Management Guideline.

- A. At any time, the originator can submit a suggested guideline addition or revision to the Technical Committee (TC) Chairman who will type on or attach to the appropriate form (see next page) and hold for submission to the Executive Committee (EC) at their annual meeting. In addition, the TC Chairman shall call a meeting and ask for other guideline submissions at least two weeks prior to the EC meeting. All new guideline submissions will be reviewed by the TC before forwarding to the EC. The TC shall also be required to undertake an annual review of existing guidelines.
- B. Upon approval of guidelines by the EC, the TC Chairman shall be responsible for sending the "new" guidelines to the appropriate users (Executive and Technical Committee Members as well as Industry Contributors). Each party receiving such shall be responsible to insure that the guideline is added to their copy of the management guideline document.

INTERAGENCY  
ROCKY MOUNTAIN FRONT WILDLIFE MANAGEMENT GUIDELINES

Addition or Revision

Date Submitted \_\_\_\_\_

By Whom Submitted \_\_\_\_\_

Suggested Guideline and Rationale:

Approved by Signature of Executive Committee Members:

Forest Supervisor, Lewis and  
Clark National Forest

CHAIRMAN \_\_\_\_\_

DATE \_\_\_\_\_

District Manager, BLM,  
Lewistown District

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Field Supervisor, U.S. Fish  
and Wildlife Services

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Regional Supervisor, Montana  
Department of Fish, Wildlife  
and Parks

NAME \_\_\_\_\_

DATE \_\_\_\_\_

